

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
30 October 2003 (30.10.2003)

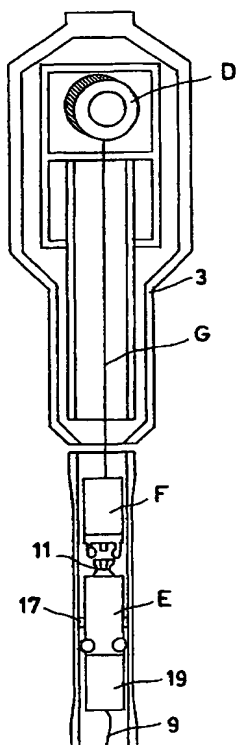
PCT

(10) International Publication Number
WO 03/089760 A1

- (51) International Patent Classification⁷: **E21B 47/12**,
23/14, 44/00
- (21) International Application Number: PCT/EP03/00746
- (22) International Filing Date: 28 January 2003 (28.01.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
MI2002A000853 22 April 2002 (22.04.2002) IT
MI2002A002331 4 November 2002 (04.11.2002) IT
- (71) Applicants (for all designated States except US): **ENI S.p.A.** [IT/IT]; Piazzale E. Mattei, 1, I-00144 Rome (IT). **TECNOMARE S.P.A.** [IT/IT]; San Marco 3584, I-30124 Venezia (IT).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **PRENDIN, Walter** [IT/IT]; Via S. Cecilia 14, I-30030 Chirignago-Venezia (IT). **MADDALENA, Danilo** [IT/IT]; Cannaregio 1782, I-30121 Venezia (IT). **TOFFOLO, Gilberto** [IT/IT]; Via Toffoli, 37, I-33080 San Foca (IT). **DONATI, Francesco** [IT/IT]; Via Correggio 44, I-20149 Milan (IT).
- (74) Agent: **DE GREGORI, Antonella**; Ing. Barzano' & Zannardo, Milano S.p.A., Via Borgonuovo, 10, I-20121 Milano (IT).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI,

[Continued on next page]

(54) Title: **TELEMETRY SYSTEM FOR THE BI-DIRECTIONAL COMMUNICATION OF DATA BETWEEN A WELL POINT AND A TERMINAL UNIT SITUATED ON THE SURFACE**



(57) Abstract: Telemetry system for the bi-directional communication of data between a well point and a terminal unit situated on the surface, which can be used inside drilling or production strings, comprising: data transmission and optional reception devices; an active vehicle (8), which can be equipped with various automation levels, ranging from purely tele-operated to completely autonomous, for unwinding and pulling a connection line, capable of moving inside the drilling or production string, or a passive vehicle (E), moved by means of a deploying cable (G) and a suitable winding/unwinding device (D), in particular a winch; a connection line (9), containing electric conductors and/or one or more optical fibres, of the transmission and optional reception devices between a well point and its corresponding point situated inside the vehicle or on the surface.



SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 03/00746

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 E21B47/12 E21B23/14 E21B44/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 E21B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	GB 2 370 590 A (XL TECHNOLOGY LTD ;TSL TECHNOLOGY LTD (GB)) 3 July 2002 (2002-07-03) page 2, line 14 - page 3, line 5; figures 18-25 page 4, line 17 - line 28 page 11, line 5 - line 14; figures 6,7 -----	1-15
Y	WO 98 12418 A (INTELLIGENT INSPECTION CORP CO) 26 March 1998 (1998-03-26) claim 1; figures 24,25,27 -----	8-10, 12-15
Y	US 5 142 990 A (LEONARD ANDRE) 1 September 1992 (1992-09-01) column 5, line 21 - line 43; figures 1,8 ----- -/--	8-10, 12-15

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

20 June 2003

Date of mailing of the international search report

18.09.2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Dantine, P.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 03/00746

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 553 732 A (BAKER HUGHES INC) 4 August 1993 (1993-08-04) column 9, line 22 - line 56; figures 1,6C -----	1,2,4, 11,22,23
A	US 5 833 015 A (WURM DIETER ET AL) 10 November 1998 (1998-11-10) column 2, line 64 - column 3, line 14; figures 2,3 -----	1,8,11, 21-26
A	US 6 041 872 A (HOLCOMB DAVID JOSEPH) 28 March 2000 (2000-03-28) column 6, line 7 - line 16; claim 1; figure 3 -----	1,8,11, 21-26
A	US 3 904 840 A (KOSTELNICEK RICHARD J) 9 September 1975 (1975-09-09) column 1, line 51 - column 2, line 27; figures 1,2 -----	1,8,11, 21-26

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 03/00746

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 2370590	A	03-07-2002	US 2002104661 A1	08-08-2002
WO 9812418	A	26-03-1998	US 5947213 A	07-09-1999
			AU 738284 B2	13-09-2001
			AU 4589597 A	14-04-1998
			BR 9706796 A	04-01-2000
			CA 2238334 A1	26-03-1998
			EP 0862682 A2	09-09-1998
			NO 982336 A	22-07-1998
			WO 9812418 A2	26-03-1998
			US 6378627 B1	30-04-2002
			US 6026911 A	22-02-2000
			US 6431270 B1	13-08-2002
			US 6112809 A	05-09-2000
US 5142990	A	01-09-1992	FR 2662989 A1	13-12-1991
			AT 134257 T	15-02-1996
			CA 2044286 A1	12-12-1991
			DE 69117101 D1	28-03-1996
			DE 69117101 T2	02-10-1996
			EP 0461964 A1	18-12-1991
			JP 5092765 A	16-04-1993
EP 0553732	A	04-08-1993	US 5294923 A	15-03-1994
			CA 2088452 A1	01-08-1993
			EP 0553732 A1	04-08-1993
			NO 930324 A	02-08-1993
US 5833015	A	10-11-1998	DE 19613788 C1	05-03-1998
			CA 2201823 A1	04-10-1997
			DE 29724364 U1	14-12-2000
			DE 59709293 D1	20-03-2003
			EP 0799969 A2	08-10-1997
US 6041872	A	28-03-2000	NONE	
US 3904840	A	09-09-1975	NONE	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP 03/00746

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-15, 21-26

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-15,21-26

System and process to install a connection cable into a pipe using a vehicle.

2. claims: 16-20

Garage to house a vehicle allowing free circulation of drilling mud
